



European Radon Solutions Database

Prepared by
: ERRICCA 2 *European Radon Research and Industry Collaboration Concerted Action*
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Existing Buildings

Generic Solution

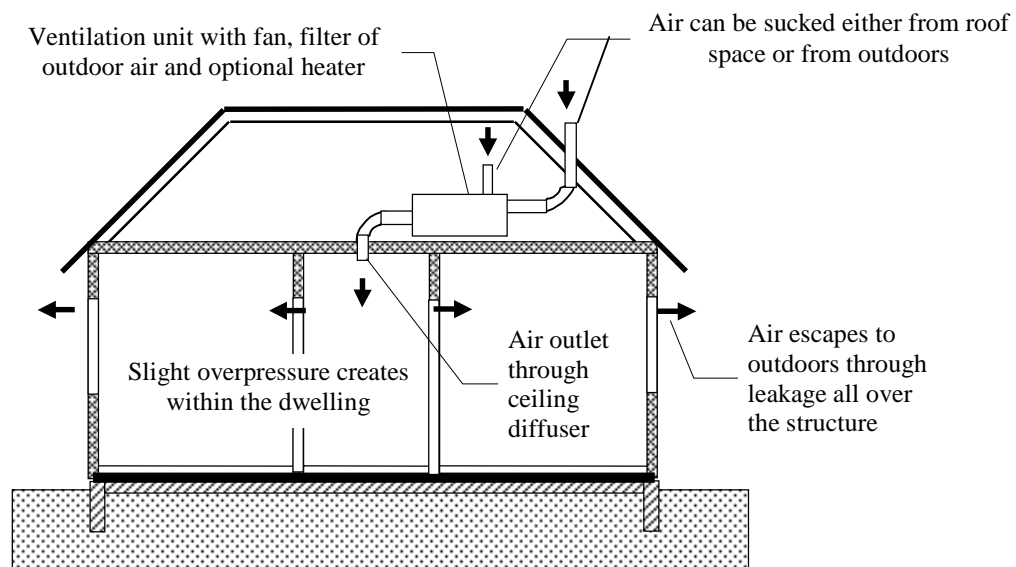
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CZ/GS/10

Type **POSITIVE PRESSURIZATION**

Country **Czech Republic**

Illustration



Description

This solution is designed to increase the indoor-outdoor air exchange rate and to create a slight overpressure within the dwelling. The overpressure eliminates the indoor underpressure, which results in decrease of the radon supply rate from the soil into the house. At the same time the rate of air exchange increases and thus radon concentration decreases also by dilution. The advantage of this solution is that it ensures higher quality of indoor air.

Ventilation unit

Ventilation units are sold as complete units ready to install either on the floor, ceiling or wall. The most commonly used types of ventilation units consist of a fan, filter of the supply air and optional heater. The fan should have a flow rate from 50 m³/h to 150 m³/h and power consumption between 10 and 15 W. The amount of supply air should ensure the air exchange rate around 0,5 changes per hour. Greater air flows will result in greater heat loss. In cold seasons and in cases, when air is sucked directly from outdoors, heaters can be used for preheating of the supply air.

To avoid disturbing noise effects the unit should be installed away from the occupied rooms, i.e. in the roof space or in non-habitable rooms.

Pipework

Air conduits can be made either of gypsum plasterboard, or of PVC-U pipes or of flexible ducting.

When to use the system

This form of radon mitigation is convenient for houses with very low air exchange rate, where radon problem is caused by radon from either building materials or from the soil. The system can be used in houses built on soils with very low permeability.

Pre-installation Diagnosis

To find source rooms (radon entry routes) and to prepare information for the effective design of the remedial measure, these parameters must be measured:

- Radon concentration in all habitable rooms performed at least by one weak measurements under conservative conditions (lower ventilation and good condition for radon entry into the house),
- Air exchange rate in all habitable rooms,
- Radon supply rate into all habitable rooms.

Typical radon reductions achieved

The effectiveness of such systems varies between 45 and 75 %, which means that indoor radon concentration decreases to 55 % up to 25 % of the initial values. The effectiveness is mainly influenced by the fan power and by the air tightness of the building envelope.

Limitations

The disadvantage of this solution is that it increases heat losses and demands regular cleaning and maintenance. To ensure that this system will perform satisfactorily, the building must be relatively airtight.

Common failure modes

The system can fail only in these situations:

- ventilation unit with inadequate pressure/flow rate characteristic is used,
- air leakage through the building envelope is high,
- house owner switches off the system.

System enhancements

The intermittent operation of the unit is recommended. The merits are: savings in operation costs, prolonged life of fans and reduced negative effects (heat losses etc.). Operating periods of the fan should be adjusted according to continuous measurements of indoor radon concentration.

Further Information

More detailed information can be found in the Czech Standard CSN 730601 "Protection of houses against radon from the soil", in detailed guides published by State Office for Nuclear Safety and on website www.suro.cz. All these information are in Czech language.

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